



FW: NW Natural, Extraction Wells PW-02U, PW-03U, PW-05U, and PW-6U Filter Pack and Screen Recommendations

John Edwards

to:

Dana Bayuk

03/23/2012 02:46 PM

Cc:

Ben Hung, John Renda, "Tim Stone", Matt Wilson, "James Peale", Sean Sheldrake, "Peterson, Lance", "Coffey, Scott", GAINER Tom, LARSEN Henning, John Edwards, "Bob Wyatt", Patty Dost

Hide Details

From: John Edwards <jedwards@anchorage.com> Sort List...

To: Dana Bayuk <BAYUK.Dana@deq.state.or.us>

Cc: Ben Hung <bhung@anchorage.com>, John Renda <jrenda@anchorage.com>, "Tim Stone" <tstone@anchorage.com>, Matt Wilson <mwilson@anchorage.com>, "James Peale" <jpeale@maulfoster.com>, Sean Sheldrake/R10/USEPA/US@EPA, "Peterson, Lance" <PetersonLE@cdm.com>, "Coffey, Scott" <CoffeySE@cdmsmith.com>, GAINER Tom <GAINER.Tom@deq.state.or.us>, LARSEN Henning <LARSEN.Henning@deq.state.or.us>, John Edwards <jedwards@anchorage.com>, "Bob Wyatt" <rjw@nwnatural.com>, Patty Dost <pdost@pearllegalgroup.com>

#### 4 Attachments



101102 Carmeuse Filtration 18056.pdf



101102 Tech Bulletin\_Gravel Pack-and-ColoradoSilicaSand\_single pages.pdf



20120323232750608.pdf



TremieMethodJohnson.pdf

Hello Dana. This email provides NW Natural's response to DEQ's March 21 email on the extraction well filter pack and screen recommendations. The stainless steel screens have been ordered and installation of the four upper alluvium extraction wells is scheduled to begin on April 9. We agree with the contents of the March 21 email with the exception of some specific agency recommendations as explained below.

1. We have ordered the approved 16x30 annular sand pack from Carmeuse Industrial Sands. Two PDF documents describing their services and product are attached. The general brochure PDF is entitled Carmeuse Filtration, and additional detail on the manufacturing and QAQC for production of the sand is provided in the PDF entitled Tech Bulletin.
2. The importance of minimizing separation of the annular filter pack sand during placement is recognized. Therefore we plan to install the filter pack sand using a tremie pipe generally following methods recommended in Groundwater and Wells, third edition. The relevant section of that text describing the tremie method is shown on the attached PDF, entitled Tremie Method Johnson.
3. We recognize agency concern that the sand pack could contain material that could cause bio fouling after construction of the well. The PDF Tech Bulletin states that Chartreuse Industrial Sands washes and cleans their product to be free of clay, silt, dirt, organic or other foreign matter. The material is also dried to allow more accurate screening. The manufacturer was contacted to obtain more information on the sand processing and a company representative said that they heat the sand to 200 degrees F during the drying process. For these reasons it is felt that the filter pack sand will be adequately free of organic matter and acceptable for this purpose. In addition, the recommended method for killing bacteria in sand pack slurry is the addition of a bactericide (see attached tremie method PDF), which is either sodium or calcium hypochlorite, or similar caustic chemical. Because groundwater at this site contains significant concentrations of total cyanide, it would not be safe for us to introduce such chemicals into the sand pack prior to installation because of the potential to generate cyanide gas at the well head. For these reasons it is not proposed to attempt to further clean the sand pack beyond the efforts that are normally made by the manufacturer.
4. We also recognize the importance of using filter pack sand that meets the gradation specifications for this project. The attached Tech Bulletin PDF demonstrates to Anchor QEA that Chartreuse Industrial Sands has a rigorous QAQC program for testing their product to assure that it meets the requested grain size and gradation specifications. A copy of a recent grain size analysis done by Chartreuse of their 16x30 sand is attached for agency review, see the PDF entitled 20120323227550608. It takes two weeks from the time of order for the drilling contractor to receive delivery of the 16x30 sand from the supplier. Therefore we will be receiving the material only a day or so before drilling is scheduled to start on April 9. Because the manufacturer has in place a rigorous QC program for testing their product it is not necessary for NW Natural to retest their product prior to use.
5. NW Natural intends to use a well screen development method that does not cause excessive infiltration of formation material into the filter pack. After placement of the sand pack, the 6-inch well screen will be gently surged with an undersized surge block or a 4-inch bailer to allow for proper sand pack settlement. Additional sand pack will be added if necessary and the well will be completed. Development will begin no sooner than 24 hours after placement of the annular seal. The sand pack will be gently surged and bailed with a 4-inch bailer. The well will be bailed from the bottom to remove sediment, if any has accumulated. Development will continue by pumping with a submersible pump at less than 10 gpm. Development will be complete when at least 10 casing volumes of water have been removed, water quality parameters (pH, specific conductivity, turbidity, and temperature) have stabilized to +/-10% of the previous reading, and sediment is removed from the well.

Please let us know if you have further questions.

Thanks

John

**John E. Edwards, RG, CEG**

**ANCHOR QEA, LLC**

\*Please note new extension and direct line number

6650 SW Redwood Lane  
Suite 333  
Portland, Oregon 97224

Main 503-670-1108, Ext 170  
Direct 503-924-6170  
Fax 503-670-1128  
Cell 503-816-6595

#### ANCHOR QEA, LLC

[www.anchorqea.com](http://www.anchorqea.com)

Please consider the environment before printing this email.

This electronic message transmission contains information that may be confidential and/or privileged work product prepared in anticipation of litigation. The information is intended for the use of the individual or entity named above. If you are not the intended recipient, please be aware that any disclosure, copying distribution or use of the contents of this information is prohibited. If you have received this electronic transmission in error, please notify us by telephone at 5036701108Ext11.

-----Original Message-----

From: BAYUK Dana [<mailto:BAYUK.Dana@deq.state.or.us>]

Sent: Wednesday, March 21, 2012 7:26 PM

To: John Edwards

Cc: Ben Hung; John Renda; Tim Stone; Matt Wilson; James Peale; 'Sean Sheldrake'; Peterson, Lance; Coffey, Scott; GAINER Tom; LARSEN Henning

Subject: NW Natural, Extraction Wells PW-02U, PW-03U, PW-05U, and PW-6U Filter Pack and Screen Recommendations

Hello John.

DEQ reviewed the "Upper Alluvium Extraction Well Design, NW Natural Gasco Site, Portland, Oregon" letter dated March 14, 2012. Anchor QEA, LLC prepared the March 14, 2012 letter for NW Natural.

Push-probe drilling and material sampling were recently completed at the proposed locations of upper Alluvium water-bearing zone (WBZ) extraction wells PW-02U, PW-03U, PW-05U, and PW-06U with the purpose of collecting material samples for grain-size testing. Grain-size tests form the basis for selecting extraction well construction materials, including the filter pack and screens for the wells.

The March 14th letter provides the results of grain-size tests, and makes recommendations for the size and gradation of filter pack material and the lengths, vertical placements, and slot-sizes of the screens for each of the four extraction wells.

Based on the results of grain-size testing, DEQ believes the filter pack and screen recommendations for extraction wells PW-02U, PW-03U, PW-05U, and PW-6U are reasonable, including equipping extraction well PW-6U with a 15-foot long screen placed from 50 to 65-feet below ground surface. The EPA team also reviewed the March 14th letter and concurs with DEQ regarding the recommendations subject to their comments (see below) being addressed.

Given the information above I contacted you earlier today by telephone, communicated the results of DEQ's review, and indicated Anchor could proceed with ordering the screens for the four extraction wells.

Although DEQ believes the filter pack and screen recommendations are reasonable, careful consideration must also be given to well construction and development methods. Due to the overall fine-grained nature of the upper Alluvium WBZ, procedures should be developed to minimize the potential for construction and/or development to reduce the capacity and operational effectiveness of extraction wells. DEQ expects procedures will be developed to:

- Minimize the potential for settling and separation of coarser sands from finer fractions during filter pack placement; and
- Effectively develop extraction wells without causing excessive infiltration of formation material into the filter pack (i.e., avoid plugging the filter pack with formation material).

Detailed descriptions of well construction and development procedures that achieve the objectives listed above should be submitted for DEQ review and approval before well construction proceeds. For clarification, procedures should also include performing the filter pack size and gradation quality control check indicated in EPA's comments.

Please feel free to contact me questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager  
 Cleanup & Portland Harbor Section  
 Oregon Department of Environmental Quality  
 2020 SW 4th Avenue, Suite 400  
 Portland, OR 97201  
 E-mail: bayuk.dana@deq.state.or.us  
 Phone: 503-229-5543  
 FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>

P please consider the environment before printing this email

-----

From: Sean Shel Drake [mailto:Shel Drake.Sean@epamail.epa.gov]  
 Sent: Wednesday, March 21, 2012 1:21 PM  
 To: BAYUK Dana  
 Cc: Peterson, Lance

Subject: Fw: Upper Alluvium Extraction Well Design

Dana,

Following are EPA's comments on the March 14, 2010 letter titled Upper Alluvium Extraction Well Design, NW Natural Gasco Site, Portland, Oregon, prepared by Anchor QEA for NW Natural. The letter discusses the grain size testing results from the recent soil borings and provides the design for extraction well filter pack sand gradation and screen slot size for the proposed upper alluvium extraction wells PW-2-U, PW-3-U, PW-5-U, and PW-6-U. EPA finds the recommended filter pack and screen slot size reasonable pending clarification/acknowledgment from NW Natural on the following:

The letter references a "typical" sand curve for 16x30 sand pack in the attachment

titled "Grading Parameters of Lapis Lustre Sands (cumulative percent passing)" provided by RMC Pacific Materials (dated October 20, 1999). NW Natural should confirm that RMC Pacific Materials will be the supplier of the sand to be used for the upper alluvium extraction well completions. Regardless of supplier, NW Natural should obtain and provide a more recent (newer than 1999) specification sheet for the type curves of the filter pack material to be delivered on site.

#### Regarding the Filter Pack:

- NW Natural should verify that the supplied filter pack is washed and sterile. Some suppliers do not sterilize the filter pack, which can lead to a more rapid bio-fouling if the filter pack has excessive bacteria.
- NW Natural should verify that the supplied filter pack meets the specifications provided in the "type" sand curve analysis that the design relies on by conducting a Quality Control check of the filter pack delivered on site. This can be achieved with a hot plate, or microwave for drying the filter pack samples (if necessary), a set of standard sieves that match those presented in the filter pack material specification sheet for the proposed filter pack, and shaker. Prior to placement, one (50 to 100 pound size) bag of filter pack should be randomly sampled per well completion (4 bags total) to confirm it meets the specifications provided by the manufacturers "type" curve. The filter pack should not vary beyond the limits of the calculated D50 range x 5, or show a passing of no more than 10% for the selected screen slot.

Let us know if you have any questions. Thank you.

S

Sean Sheldrake, RPM, Unit Diving Officer USEPA, Region 10  
Environmental Cleanup Office  
1200 Sixth Avenue, Suite 900, ECL-110  
Seattle WA 98101-3140

sheldrake.sean@epa.gov  
Phone: 206/553-1220

Region 10 Dive Team: <http://www.epa.gov/region10/dive>

#### EPA Divers only:

<http://204.47.216.153:9876/r10/infopage/cleanup.nsf/webpage/DSBtechdirector>  
Portland Harbor Cleanup: <http://www.epa.gov/region10/portlandharbor>  
Green Cleanups: <http://yosemite.epa.gov/R10/extaff.nsf/programs/greencleanups>  
Green Cleanups (EPA only):  
<http://204.47.216.153:9876/r10/infopage/cleanup.nsf/webpage/greener+cleanups>  
Health and Safety (EPA only):  
<http://204.47.216.153:9876/r10/infopage/cleanup.nsf/webpage/H&Sec1>  
Deliveries: Parking Garage mailroom (1st floor)  
Visitors: Check-in @ PERC / Service Center on 12th floor:  
<http://yosemite.epa.gov/r10/extaff.nsf/Homepage/Visiting+Seattle>

-